Remarks

Claims 1-16 are pending in this application. Upon entry of this Amendment, claims 1, 3, 10 and 11 will be amended, and claim 2 will be cancelled. The claims have been amended to even more particularly point out and distinctly claim Applicant's invention. No new matter has been added by these amendments.

Rejection Under 35 U.S.C. § 112

Claims 1-16 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The Examiner pointed out that the term "polymerized monomer" as it appears in at least claims 1 and 11 lacked antecedent basis. Claims 1 and 11 have been amended to provide the necessary antecedent basis.

Rejection Under 35 U.S.C. § 103 (a)

The Examiner rejected claims 1, 2, 4-7 and 10-14 under *35 U.S.C. § 103 (a)* as being unpatentable over USP 4,767,821 of Lindner et al ("Lindner").

In order to establish a *prima facie* case of obviousness based on a single reference, the Examiner must establish all three of the following essential criteria: (1) there must be a motivation in the cited prior art to modify the reference as suggested by the Examiner; (2) the cited reference must teach or suggest each of the claimed elements; and (3) the cited reference must provide a basis for a reasonable expectation for success. The motivation to modify and the reasonable expectation for success must come from the cited prior art and not the Applicant's specification. Further, it is not enough that a reference can be modified absent a suggestion in the cited prior art to undertake such modification.

Claim 1 has been amended so as to incorporate the limitations of original claim 2, and now specifies that the propylene polymer material is selected from five different types of propylene polymer materials (components (1)(I) to (1)(V)). All of these materials are different than EPDM polymers, as illustrated in Table I.

Table I

Polymer	Monomer composition	Characteristics
EPDM	Ethylene, propylene, diene	Rubber, no measurable flexural modulus
Claim 1 component (1) (I)	Propylene	Homopolypropylene
component (1)(II)	Propylene, ethylene or C_4-C_{10}	Thermoplastic
component (1)(III)	Propylene, ethylene and C_4-C_{10}	Thermoplastic
component (1)(IV)	(a) Propylene, ethylene, C_4-C_{10} (b) Ethylene, propylene or C_4-C_8 (c) (i) ethylene and propylene (c) (ii) ethylene, propylene and C_4-C_8 ***(c) (iii) ethylene and C_4-C_8 optionally a diene***	- Thermoplastic - Polymerized in at least two stages and at least one of the components is a propylene polymer with an isotactic index greater than 80. - Flexural modulus less than 150 Mpa.
component (1)(V)	(a) (i) ethylene and propylene (a) (ii) ethylene, propylene and C_4-C_8 (a) (iii) ethylene and C_4-C_8 (b) (i) ethylene and propylene (b) (ii) ethylene, propylene and C_4-C_8 ***(b) (iii) ethylene and C_4-C_8 and optionally diene*** (c) ethylene, propylene or C_4-C_8	-Thermoplastic - Flexural modulus greater than 150 but less than 1200 Mpa.

The EPDM rubber as defined in Lindner contains ethylene, propylene and small amounts of a non-conjugated diene (column 2, lines 38-39). It is well known that EPDM such as that used by Lindner is a rubber material that has no measurable flexural modulus (Polymer Handbook, 4th ed., Wiley-Interscience, page V/169, attached). In addition, it has a tensile modulus of 1.2-5.6 MPa (*Id.*), which is much lower than that of propylene polymer (1380 MPa, *Id.* at page V/165, attached). Finally, EPDM rubber has a very low crystallinity and isotactic index, in order to impart its rubbery characteristics.

The presently claimed invention does not include an EPDM rubber. The only diene-containing components in the present invention are components (1)(IV)(c)(iii) and (1)(V)(b)(iii), as exemplified in claim 1, and illustrated in Table I above. However, neither component (1)(IV)(c)(iii), nor component (1)(V)(b)(iii) of claim 1 contains propylene. In addition, both components are thermoplastic materials that contain crystalline polymer, and therefore have

improved flexural or tensile properties, as compared to EPDM rubber. Component (1)(IV)(c)(iii) is polymerized in at least two stages, and at least one of the components is a propylene polymer with an isotactic index greater than 80, which is normally a crystalline thermoplastic. Component (1)(V)(b)(iii) has a flexural modulus of greater than 150 MPa, which clearly indicates that it is not a rubbery material. Therefore, it is clear that the propylene polymer materials claimed in the present invention are different than the EPDM rubber as disclosed in Lindner, so that the reference does not teach all elements of the present invention. Further, the present invention and the cited reference contain polymers that are used in different technical fields; that is, thermoplastics and rubber, so that there is no motivation or suggestion in the cited prior art to modify the reference to arrive at the presently claimed invention, and no reasonable expectation of success. Applicant therefore respectfully submits that a *prima facie* case of obviousness has not been made out, and request reconsideration and withdrawal of the Rejection.

The Examiner also rejected claims 1, 2, and 4-16 under *35 U.S.C. § 103 (a)* as being unpatentable over USP 4,945,130 of Genz et al ("Genz").

Genz discloses a composition containing a component "C" which is a fluorinated polyolefin and a component "D" which may include EPDM as "graft bases." The EPDM is defined as rubbers of ethylene, propylene and an unconjugated diene monomer (column 9, lines 15-16). As discussed above in reference to Lindner, neither component (1)(IV)(c)(iii) nor component (1)(V)(b)(iii) of claim 1 contains propylene. Further, EPDM rubber has distinct mechanical properties as compared with the thermoplastics used in the present invention, Applicant respectively submit therefore that a *prima facie* case of obviousness has not been made out.

Furthermore, dependent claims 6, 7, 13 and 14 of the present invention additionally contain a broad molecular weight distribution propylene polymer material, which is a propylene polymer material having xylene insolubles at 25 °C of greater than or equal to 94%. Neither Lindner nor Genz disclose or suggest this broad molecular weight distribution propylene polymer material. Further, such high xylene insolubles are indicative of a high degree of crystallinity and better physical properties than the EPDM rubbery material could provide. Therefore, the reference does not teach all the elements recited dependent claims.

In view of the above, the Examiner is respectfully requested to withdraw the rejections,

and pass this application to issue. Should the Examiner have questions or comments regarding this application or this amendment, Applicant's attorney would welcome the opportunity to discuss the case with the Examiner.

If there is any fee required for entry and consideration of this Amendment, the Commissioner is hereby authorized to charge U.S. PTO Deposit Account 08-2336 in the required amount.

Respectfully submitted,

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3616

POLYMER HANDBOOK

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TABLE 2. POLYOLEFINS AND BARRIER POLYMERS

Property	Unit	Test method	HDPE[a]	LDPE[b]	LDPE[c]	LL
MECHANICAL						
Density	g/cm^3	D792	0.941–0.967	0.921	0.923	
Tensile strength	MPa	D638	19–30	10.3	9.6	MD
						CD
Tensile modulus	MPa	D638	800–1400	165.5	248	MD
						CD
Flexural modulus	MPa	D638	700–1700			
Elongation to break	%	D638	10–1000	620	270	MD
						CD
Notched izod at room temp.	J/m	D256	27–160	42.7 at −50°C	48 at −50°C	
Hardness		D785				
THERMAL						
Deflection T @ 264 psi	°C	D648				
Deflection T @ 66 psi	°C	D648	65–95	41		
Vicat softening point	°C	D1525	120–130	91	93	
UL temp. index	°C	UL7468				
UL flammability code rating		UL94				
Linear coefficient of thermal expansion	mm/mm/°C	D696	$100–200 \times 10^{-6}$	$\sim 250 \times 10^{-6}$	$\sim 250 \times 10^{-6}$	160–200
ENVIRONMENTAL						
Water absorption 24 h	%	D570	<0.01	<0.01	<0.01	
Clarity	%Transmission	D1003		Translucent		
Outdoor weathering	%	D1435				
FDA approval			Yes	Yes	Yes	Ye
CHEMICAL RESISTANCE TO:						
Weak acid		D543	Not attacked	Not attacked	Not attacked	Not at
Strong acid		D543	Minimally attacked	Minimally attacked	Minimally attacked	Minimall
Weak alkali		D543	Not attacked	Not attacked	Not attacked	Not at
Strong alkali		D543	Not attacked	Not attacked	Not attacked	Not at
Low molecular weight solvents		D543	Minimally attacked	Minimally attacked	Minimally attacked	Not
Alcohols		D543	Not attacked	Not attacked	Not attacked	Not
ELECTRICAL						
Dielectric strength	KV/mm	D149	16–24			
Dielectric constant		D150	2.2–3.0	2.2	2.2	
Power factor		D150	0.00005–0.003	0.0003	0.0003	<0.0
OTHERS						
Melting point	°C	D3418	130–137			
Glass transition temp.	°C	D3418	Not measurable	−35 inferred	−35 inferred	−35
Special					Minimum heat seal; temperature: 132°C	

[a] Properties of range.
[b] General purpose, for film & molding.
[c] For injection molding.
[f] Blown film grade, film properties reported.
[i] 38 mol% ethylene

Polymer name					
LLDPE[e]	VLDPE (or ULDPE)[f]	POP[g]	PP	PVDC[h]	EVOH[i]
0.917	0.912	0.896	0.903	1.7	1.17
15.9	MD 57.9 CD 49.6	MD 49 CD 43	35.5	34.5	60
221	MD 122 CD 135		1380	516.8	
283			1690		
850	MD 575 CD 700	MD 600 CD 710	Depends on specimen molding, history	25	240
40 at −50°C			37 100	37.4 60	
			55 101	49	
96		80	154 115	135	
			HB	V-0	
160–200 × 10⁻⁶	~250 × 10⁻⁶		90 × 10⁻⁶	34 × 10⁻⁵	
<0.01	<0.01	<0.01	<0.03	0.1 85 moderate discoloration	>1.0
Yes	Yes		21 CFR 177.1520 (c) 1.1	Yes	Yes
Not attacked Minimally attacked	Not attacked Minimally attacked	Not attacked Minimally attacked	Excellent Varies with acid	Not attacked Not attacked	
Not attacked	Not attacked	Not attacked	Excellent	Minimally to badly attacked	
Not attacked	Not attacked	Not attacked	Good	Minimally to badly attacked	
Not soluble	Minimally attacked	Minimally attacked	Nonpolar swells; polar excellent	Not attacked	
Not soluble	Not attacked	Not attacked	Excellent	Not attacked	
2.3	~2.2		24–28 2.25		
<0.0005	~0.0003		0.0003		
−35 inferred	−38 inferred Seal initiation temperature: 102°C; Oxygen permeability at 23°C: 1900 nmol/m.s.GPa; Toughness (D882) −MD 97 J/cm³ −CD 127 J/cm³	−45 Oxygen permeability at 23°C: 3200 nmol/m.s. GPa	164 −20	160 −4 Oxygen permeability at 23°C: 0.2 nmol/m.s. GPa; WVTR (37.8°C, 90% RH): 0.06 g mil/100 in.² day	175 62 (Dynamic) Oxygen permeability at 23°C 65% RH = 0.08 nmol/m.s. GPa; WVTR at 40°C 90%RH = 1.4 g.mil/100 in.² day

[e] For extrusion coating.
[f] Homogeneous catalyst, blown film grade, film properties reported.
[g] For blown film, mechanical properties for blown film with blow up ratio 2:3.
[h] Extrusion grade.

TABLE 4. ELASTOMERS

Property	Unit	Test method	Silicone[a]
MECHANICAL			
Density	g/cm^3	D792	0.97, greater when fill
Tensile strength	MPa	D638	1.0–5.5
Tensile modulus	MPa	D638	
Flexural modulus	MPa	D638	
Elongation to break	%	D638	200–850
Notched izod at room temp.	J/m	D256	
Hardness		D785	Shore A 20–60
THERMAL			
Deflection T @ 264 psi	°C	D648	
Deflection T @ 66 psi	°C	D648	
Vicat softening point	°C	D1525	
UL temp. index	°C	UL746B	
UL flammability code rating		UL94	
Linear coefficient thermal expansion	mm/mm/°C	D696	$10–19 \times 10^{-6}$
ENVIRONMENTAL			
Water absorption 24 h	%	D570	0.1
Clarity	% Transmission	D1003	
Outdoor weathering	%	D1435	
FDA approval			
CHEMICAL RESISTANCE TO:			
Weak acid		D543	
Strong acid		D543	Fair
Weak alkali		D543	
Strong alkali		D543	Fair
Low molecular weight solvents		D543	Varies
Alcohols		D543	
ELECTRICAL			
Dielectric strength	kV/mm	D149	16–22
Dielectric constant		D150	3.0–3.5
Power factor		D150	0.001–0.01
OTHERS			
Melting point	°C	D3418	
Glass transition temp.	°C	D3418	
Special			

[a] Flexible casting resins, e.g RTV.
[b] Range for elastomeric grades, 25–36 wt.% chlorine.
[c] Homogeneous catalyst, molding grade.
[d] Polyester Polycaprolactone Resin.
[e] Fully formulated.

Polymer name			
CPE[b]	POE[c]	TPu[d]	EPDM[e]
1.10–1.16	0.87	1.20	0.86, Polymer
21-Sep		42	6–16
At 200% elongation 1.2–11.7	18	8	1.2–5.6 at 50% elongation
	22	83	–
300–800	>1000	425	100
No break			–
Shore A>60	Shore A 72	Shore A 93A	Shore A 57–93
Flexible		Varies	
Flexible			
Flexible	41		
		Medium	Varies
	<0.01	0.3	
			Opaque
			Excellent
	Varies	Possible	Some
Not attacked	Not attacked	Stable	Excellent
Not attacked to badly attacked	Minimally attacked	Medium	Excellent, Varies
Not attacked to badly attacked	Not attacked	Stable	Excellent
Not attacked to badly attacked	Not attacked	Medium	Excellent, Varies
Not attacked to badly attacked	Minimally attacked	No effect to attacked	Fair, Varies
Not attacked to minimally attacked	Not attacked	No effect	Good
14.8–19.7			900
4.3–5.1			3.0–3.5
0.1			0.004–0.008
	60	Varies	Most Grades Amorpnous
–20	–55	–15	
		Taber Abrasion resistance 10 mg	